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Memo

DATE: *October 10, 2003*

TO: RHIC E-Coolers

FROM: *Ady Herscovitch*

SUBJECT: **Minutes of the October 10, 2003 Meeting**

Present: Michael Blaskiewicz, Andrew Burrill, Rama Calaga, Xiangyun Chang, Yury Eidelman (ORNL & BINP Novosibirsk, Russia), Alexei Fedotov, Michael Harrison, Ady Herscovitch, Vladimir Litvinenko, Derek Lowenstein, William Mackay, Thomas Roser, Dejan Trbojevic.

Topics discussed: Stochastic Cooling, Optical Cooling Workshop, and Superconducting Solenoid.

Stochastic Cooling: in answer to Thomas' question Mike Blaskiewicz gave a briefing on the planned stochastic cooling test at RHIC. The plan for this year is to try and to close the loop on the feedback system. A 4-8 GHz stochastic cooling pickup system, a kicker, and a 250 Watt amplifier were borrowed from FNL for this test. Though 250 Watt does not seem to be enough power, the plan is to try and to cool a single bunch using pulse compression technique. The idea behind the use of pulse compression techniques is to exploit the dead time between bunches to level the rf power. Power is applied only when the bunch is present. Additionally, a wave-guide is to be inserted to obtain a factor of four in power enhancement. The cooling of a single bunch will be mainly in the longitudinal direction.

In answer to Alexei regarding solitons, Mike Blaskiewicz replied that in the case of gold ions solitons diffuse due to intrabeam scattering (IBS). But, solitons were observed in the case of protons and deuterons. After Derek's question regarding the mass threshold for solitons, a short discussion ensued on the effect of IBS. Mike Harrison pointed out that IBS is proportional to Z to the fourth power. To Dejan's question regarding cooling determination, Mike Blaskiewicz replied that it would be done from the Schottky signals. Thomas pointed out that it would be better to measure the shrinking of the bunch length. Mike Blaskiewicz agreed that it is the better measurement.

Optical Cooling Workshop: Vladimir gave a brief report on the Optical Cooling Workshop. He pointed out that Vitaly (who was not present) is more qualified to give the report. The crux-of-the-matter is to show the feasibility of a cadmium-gallium-arsenic crystal. With LDRD funding test of 8 mm crystal with 200 Watt 5.3 micron radiation is to be performed. Expected amplification is a factor of 70. For optical cooling, a factor 130,000 amplification

is needed. Nevertheless the scheme is feasible, since amplification scales exponentially with crystal length, e.g., for a 16 mm crystal amplification factor of 4900 is expected (70^2).

Superconducting Solenoid: in an answer to Thomas question on the status of the superconducting solenoid, Mike Harrison said that decisions were made regarding the short sample testing. It will be done with a 3 Tesla short sample.